

Abstract

**Single Mode Distributed Feedback Lasers**

5 The present invention relates to solid state distributed feedback (DFB) lasers in which a phase shift is introduced to optical radiation circulating in a laser cavity in order to stabilise the laser into single mode operation. A solid state single mode distributed feedback (DFB) laser (1), comprises a  
10 laser waveguide (10), a DFB grating structure (6) optically coupled to the waveguide (10) for stabilising the wavelength of optical radiation (7) in the waveguide (10), one or more current conduction regions (4',4'') for guiding an applied electrical current to pump the laser waveguide (10) and at  
15 least one current constriction region (40) adjacent the one or more current conduction regions (4',4''). The DFB structure (6) extends in the current constriction region (40) and at least one of the current conduction regions (4',4''). The current conduction and constriction regions (4',4'',40) are  
20 arranged so that an electrical current (34) applied to the current conduction region(s) (4',4'') pumps the laser waveguide (10) preferentially in the current conduction regions (4',4'') compared with the electrical constriction region (40) and thus varies the effective index of refraction  
25 (38) of the laser waveguide (10) in these regions (4',4'',40) in order to stabilise the optical radiation (7) for single mode operation of the laser (1).

Figure 1

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